APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/087,347	03/01/2002	Mark E. Rorvig	4380.001300-	3070

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EXAMINER
SETH, MANAV

ART UNIT	PAPER NUMBER
2625	

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Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	10/087,347	RORVIG ET AL.
	Examiner	Art Unit	
	Manav Seth	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 March 2002*.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-52* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-52* is/are rejected.

7)☒ Claim(s) *15,41* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date *12/02/2003*.

4)☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Claim Objections

1.   Claims 15 and 41 are objected to because of the following informalities:

Claim 15 recites the limitations "constructing a second histogram for each of the selected features using the second measurement information; determining a **first** (assumed for examining purpose: **second**) area encompassed by each of the **first** (assumed for examining purpose: **second**) histograms; encoding the **first** (assumed for examining purpose: **second**) areas of the **first** (assumed for examining purpose: **second**) histograms in metadata elements of a **first** (assumed for examining purpose: **second**) hypertext markup language (HTML) document; and".

Claim 41 "means for constructing a second histogram for each of the selected features using the second measurement information; means for determining a **first** (assumed for examining purpose: **second**) area encompassed by each of the **first** (assumed for examining purpose: **second**) histograms; means for encoding the **first** (assumed for examining purpose: **second**) areas of the **first** (assumed for examining purpose: **second**) histograms in metadata elements of a **first** (assumed for examining purpose: **second**) hypertext markup language (HTML) document; and".

Applicant in claims 15 and 41 recites the measurement of selected features of first object and second object. In these claims, first area under first histograms are

associated with first object and further linked to first HTML document and again first

area under first histograms are associated to second object and further linked to first

HTML document. These limitations are inconsistent with the limitations:

1. Claim 15 - "constructing a **second** histogram for each of the selected features

using the second measurement information".

2. Claim 41 – "means for constructing a **second** histogram for each of the

selected features using the second measurement information".

Therefore, it is assumed by the examiner for the examining purposes that a

second area under second histograms is calculated for second object and are further

linked to second HTML document.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

2.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

3.   Claims 1, 2, 27, 28, 40 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Abdel-Mottaleb et al., U.S. Patent No. 5,915,038 in view of

Tsymbalenko et al., Jan. 9, 2001, "Using HTML Metadata to find relevant images on the

world wide web".

        Claim 1 recites "retrieving a first object, wherein the first object comprises a first

measurement information encoded in metadata elements of a first hypertext mark up

language (HTML) document". Abdel-Mattaleb discloses computing an index key

(metadata) for a query (first) image where as the query (first) image is an image

identified (retrieved) by the user for use in retrieving other similar images (column 3,

lines 40-43; column 4, lines 38-43). Abdel-Mettaleb further discloses the extraction of

index keys is the extraction of metadata, where extracting metadata is the measurement

of the features of the still images (column 7, lines 17-23).

        Claim 1 further recites "comparing the first object with a second object, wherein

the second object comprises a second measurement information encoded in metadata

elements of a second hypertext markup language (HTML) document". Abdel-Mettaleb

discloses the comparison of the index key (metadata information) of the query (first)

image with each index key of the corresponding image (second) being searched

(column 3, lines 45-50).

        Claim 1 recites "retrieving 'the second object in response to the difference

between the first measurement information of the first HTML document and the second

measurement information of the second HTML document being less than or equal to a

threshold difference value". Abdel-Mettaleb discloses the selection of the second image

with respect to the threshold difference value (column 3, lines 50-60).

Abdel-Mettaleb further discloses that the still images may be stored locally or

remotely, such as a remote Web site on the Internet and archived using the index key

extraction and archival process (column 8, lines 13-16). Abdel-Mettaleb does not

explicitly teach the encoding of metadata information in metadata elements of a HTML

document.

However, Tsymbalenko discloses the image retrieval system where the images

are accessed through HTML documents and that the bulk of the content of HTML

documents is textual whereas the textual content and the structure of HTML documents

are considered to be "metadata" describing the images and this metadata is used to

determine which images may be relevant to a query (page 3, paragraph 2).

Tsymbalenko further discloses the search strategy where the result showed a HTML

document with links to other HTML documents that best matched the query (page 3,

paragraph 5) and every image is linked to each HTML document (page 3, para. 6, lines

2-3).

Therefore, it would had been obvious to one having ordinary skill in the art at the

time of the invention was made to include the teachings by Tsymbalenko in the

invention of Abdel-Mettaleb. One would have been motivated to use the concept of

image metadata encoding in the HTML documents by Tsymbalenko in the invention of

Abdel-Mettaleb because both the references are directed to image search and retrieval.

Abdel-Mettaleb discloses that the still images may be stored locally or remotely, such as

a remote web site on the internet and Tsymbalenko further provides the image search

and retrieval using the HTML documents where each image index key (metadata)

extracted from Abdel-Mettaleb's invention can be encoded in HTML document as a

textual information and the advantage of using metadata textual information would lead

in saving memory and bandwidth on the image retrieval system.

Claim 2 has been analyzed and rejected as per claim 1.

Claim 27 additionally recites the system that retrieves images by content

measure metadata encoding. Abdel-Mettaleb discloses the use of computer system for

his invention (column 6, lines 24-37). All other limitations in claim 27 had been analyzed

and rejected as per claim 1.

Claim 28 has been analyzed and rejected as per claims 1 and 27.

Claim 40 has been analyzed and rejected as per claim 27.

4.   Claims 3, 9-12, 14, 29, 35-38 and 40 are rejected under 35 U.S.C. 103(a) as

being unpatentable over Eakins et al., Jan. 1999, "Content-based image retrieval: a

report to the JISC technology applications programme", in view of Opittek et al., U.S.

Patent No. 3,979,555, and further in view of Tsymbalenko et al., Jan. 9, 2001, "Using

HTML Metadata to find relevant images on the world wide web".

Claim 3 recites "A method of encoding images by content measure metadata encoding, comprising: measuring selected features of an object to form measurement information; constructing a histogram for each of the selected features using the measurement information". Eakins discloses content-based image retrieval (CBIR) methods (page 18) and systems (page 23) where stored images are retrieved from a collection by comparing features automatically extracted from the **images** themselves where the commonest features used are mathematical measures of **color, texture or shape** (page 18, para. 3). Eakins further discloses measuring the proportion of pixels of **each** color within the image and a color histogram is computed to show this measurement (page 18, para. 4, lines 2-4).

Claim 3 further recites "determining an area encompassed by each of the histograms". Eakins does not teach of calculating an area encompassed by histogram for each of the selected features. However, Opittek discloses **calculating a total area under histogram** to compute the total distribution of gray scale intensity levels in the image (column 3, lines 13-20). Opittek discloses a histogram in figure 1-4 where x-axis represents internal division of the selected feature (intensity of a color) and y-axis represents a frequency of occurrence of intensity level.

Therefore, it would had been obvious to one having ordinary skill in the art at the time of the invention was made to use the concept of calculating area under the histogram by Opittek in the invention of Eakins. One would have been motivated to use the concept of calculating area under the histogram by Opittek in the invention of Eakins

because Eakins computes a color histogram for each color within the image and Opittek's further shows the histogram in standard x-y coordinate format with x-axis representing internal division of the selected feature (intensity of a color) and y-axis representing a frequency of occurrence of intensity level in figure 1 and then **calculates a total area under this histogram** to compute the total distribution of color intensity levels in the image and calculating area will provide a mathematical value of the distribution of the color intensity levels.

Claim 3 further recites "encoding areas of the histograms in metadata elements of a hypertext markup language (HTML) document". Eakins discloses the encoding of parameters such as the color space on which the histogram is based in metadata elements of a XML (Extensible Markup Language) document. Eakins does not teach encoding in metadata elements of a HTML document. Encoding in metadata of HTML is well known in the art and this is supported by Tsymbalenko et al., which further discloses that each image is associated to each HTML document as explained n claim 1.

Claim 9 recites "A method of claim 4, wherein measuring selected features further comprises measuring a geometric feature of the object". The features such as shape, size, distance, rotation angle, etc., are standard types of geometric features depending on the object type Therefore claim 9 has been analyzed and rejected as per claim 3.

Claim 10 and 11 had been analyzed and rejected as per claim 9.

Claim 12 has been analyzed and rejected as per claim 3.

Claim 14 has been analyzed and rejected as per claim 3 and in further in view of claim 1.

Claim 29 recites a system that performs the method as recited in claim 3. Eakins further discloses many content-based image retrieval systems and these systems use the same method as recited in claim 3 (page 23; page 18, para. 3, lines 3-4). Therefore, claim 29 has been analyzed and rejected as per claim 3.

Claim 35 has been analyzed and rejected as per claim 29 and further in view of claims 3 and 9.

Claims 36 and 37 had been analyzed and rejected as per claim 35.

Claim 38 has been analyzed and rejected as per claim 29 and further in view of claim 3 and 12

Claim 40 has been analyzed and rejected as per claim 29 and in further view of claims 3,14 and 1.

5. Claims 4-8 and 30-34 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Eakins et al., Jan. 1999, "Content-based image retrieval: a report to the JISC

technology applications programme", in view of Opittek et al., U.S. Patent No.

3,979,555, and further in view of Tsymbalenko et al., Jan. 9, 2001, "Using HTML

Metadata to find relevant images on the world wide web", and further in view of Baxes,

1994, Book Publication, "Digital image processing: principles and applications".

Claim 4 recites "A method of claim 3, wherein measuring selected features

further comprises measuring an intensity of a preselected color of the object". As

explained in rejection of claim 3, the combined invention of Eakins and Opittek

determines intensity levels of each color based on the histograms. Therefore claim 4

has been analyzed and rejected as per claim 3.

It is well known in the art that each color can be red, green or blue as in RGB

space and each color can also be a gray color in a gray-scale image. This well known

art is further support by Baxes, who in his book printed in 1994, discloses that three

histograms can be generated in an RGB space for each color component (page 63,

para 3; page 64, para 1 and figures 3.20(a), 3.20(b) and 3.20(c). Therefore, it would had

been obvious to one having ordinary skill in the art at the time of the invention was

made to use the concept of constructing histograms for a preselected color as disclosed

by Baxes. One would have been motivated to use the concept of Baxes because each

histogram can help to determine the brightness distributions, contrast, and dynamic

ranges of the individual components where brightness is the measured intensity of the

pixels in the image (page 3).

Claims 5, 6, 7, and 8 had been analyzed and rejected as per claim 4.

Claims 30, 31, 32, 33, 34 had been analyzed and rejected as per claim 29 and in

further view of claims 4, 5, 6, 7 and 8.

6.   Claims 13 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Eakins et al., Jan. 1999, "Content-based image retrieval: a report to the JISC

technology applications programme", in view of Opittek et al., U.S. Patent No.

3,979,555, and further in view of Tsymbalenko et al., Jan. 9, 2001, "Using HTML

Metadata to find relevant images on the world wide web" and further in view of Rorvig,

"An experimental approach for the content-based image analysis: an open source

agenda for research".

Claim 13 recites "a method of claim 3, further comprising converting the area

under the histogram to a Lorenz Information Measure (LIM)". Eakins, Opittek and

Tsymbalenko do not teach converting the area under the histogram to a Lorenz

Information Measure (LIM). However, Rorvig teaches converting the area under the

histogram to a Lorenz Information Measure (page 14 and 15). Using LIM to convert the

area under the histogram is well known in the field of distributional analysis, such as

economics.

Therefore, it would had been obvious to one having ordinary skill in the art at the time of the invention was made to use the invention of Rorvig in the combined invention of Eakins, Opittek and Tsymbalenko. One would have been motivated to use Rorvig's invention in the combined invention of Eakins, Opittek and Tsymbalenko because using Rorvig's concept of using LIM on the area of compassed by the histogram will convert histogram values to a single value and then this single value can be encoded as metadata name tags in HTML as per Tsymbalenko rather than attempting to use all of the individual data in the histogram.

Claim 39 has been analyzed and rejected as per claim 29 and in further view of 13.

7.   Claims 15, 21-24, 26, 41, 47-50 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abdel-Mottaleb et al., U.S. Patent No. 5,915,038, in view of Eakins et al., Jan. 1999, "Content-based image retrieval: a report to the JISC technology applications programme", and further in view of Opittek et al., U.S. Patent No. 3,979,555, and further in view of Tsymbalenko et al., Jan. 9, 2001, "Using HTML Metadata to find relevant images on the world wide web".

Claim 15 recites a method of retrieving images by content measure metadata encoding. As explained in the rejection of claim 1, Abdel-Mottaleb, extract (measures) an index key (metadata) for the query (first) image and then generates the key index for each of the images to be searched, where extracting metadata is the measurement of

the features of the still images, and further discloses the selection of the second image with respect to the threshold difference value. Abdel-Mettaleb does not go into the details of constructing histogram for each feature measured, then generating area under histogram and further encoding the areas under histogram in metadata elements of a HTML document.

However, the invention of Eakins combined with Opittek and Tsymbalenko, as explained in the rejection of claim 3, provides the detailed steps of the image analysis required on the query (first) image and all other images to be searched and further provides the concept of encoding of metadata in metadata elements of a HTML document. Therefore, it would had been obvious to one having ordinary skill in the art at the time of the invention was made to use the combined invention of Eakins, Opittek and Tsymbalenko in the invention of Abdel-Mettaleb. One would have been motivated to use the combined invention of Eakins, Opittek and Tsymbalenko in the invention of Abdel-Mettaleb because Abdel-Mettaleb, Eakins, and Tsymbalenko are directed to the methods and systems of image search and retrieval and Eakins further go more in detail of using content features in the image search and retrieval to optimize the search techniques and have better image similarity results and Opittek further provides the concept of image analysis on the selected image features such as obtaining a total mathematical measure (metadata) of color intensity distribution and Tsymbalenko further supports Abdel-Mettaleb method of searching the images on web by encoding the metadata of the images in the metadata elements of the HTML document as explained in the rejection of claim 1.

Claim 21 has been analyzed and rejected as per claim 15 and further in view of claims 3 and 9.

Claim 22 and 23 had been analyzed and rejected as per claim 21.

Claim 24 has been analyzed and rejected as per claim 15 and further in view of claims 3 and 14.

Claim 26 has been analyzed and rejected as per claim 15 and further in view of claim 14, 3 and 1.

Claim 41 recites a system that performs the method recited in claim 15. Claim 41 has been analyzed and rejected as per claim 27.

Claim 47 has been analyzed and rejected as per claim 41 and in further view of claim 21.

Claims 48 and 49 has been analyzed and rejected as per claim 47.

Claim 50 has been analyzed and rejected as per claim 41 and further in view of claim 24.

Claim 52 has been analyzed and rejected as per claim 41 and further in view of claim 26.

8.   Claims 16-20 and 42-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abdel-Mottaleb et al., U.S. Patent No. 5,915,038, in view of Eakins et al., Jan. 1999, "Content-based image retrieval: a report to the JISC technology applications programme", and further in view of Opittek et al., U.S. Patent No. 3,979,555, and further in view of Tsymbalenko et al., Jan. 9, 2001, "Using HTML Metadata to find relevant images on the world wide web", and further in view of Baxes, 1994, Book Publication, "Digital image processing: principles and applications".

Claim 16 recites "A method of claim 15, wherein measuring selected features further comprises measuring an intensity of a preselected color of the object". Abdel-Mottaleb does not teach of measuring intensity of a preselected color of the object but measuring of intensity of color with motivation has been explained in the rejection of claim. The claim 16 has been analyzed and rejected as per claim 15 and in further view of claim 4.

Claims 17-20 had been analyzed and rejected as per claims 16 and 15 and further in view of claims 5-8.

Claims 42-46 had been analyzed and rejected as per claims as per claim 41 and in further view of claims 16-20.

9.　　Claims 25 and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abdel-Mottaleb et al., U.S. Patent No. 5,915,038, in view of Eakins et al., Jan. 1999, "Content-based image retrieval: a report to the JISC technology applications programme", and further in view of Opittek et al., U.S. Patent No. 3,979,555, and further in view of Tsymbalenko et al., Jan. 9, 2001, "Using HTML Metadata to find relevant images on the world wide web" and further in view of Rorvig, "An experimental approach for the content-based image analysis: an open source agenda for research".

Claim 25 recites "a method of claim 15, further comprising converting the area under the histogram to a Lorenz Information Measure (LIM)". Abdel-Mottaleb, Eakins, Opittek and Tsymbalenko do not teach converting the area under the histogram to a Lorenz Information Measure (LIM). However, Rorvig teaches converting the area under the histogram to a Lorenz Information Measure (page 14 and 15) as explained in the claim 13 with motivation. Therefore, claim 25 has been analyzed and rejected as per claim 25 and in further view of claim 13.

Claim 51 has been analyzed and rejected as per claim 25.

Conclusion

10.   The prior art of record and not relied upon is considered pertinent to applicant's disclosure:

- Kim et al., U.S. Patent No. 6,754,667, discloses a content based image retrieval system and method of retrieving image using the same.

- Tsujimura et al., U.S. Patent No. 5,586,197, discloses image searching method and apparatus thereof using color information of an input image.

- Mukherjea et al., U.S. Patent No. 6,415,282, discloses a method and apparatus for query refinement.

- Yoon et al., U.S. Patent No. 6,621,926, discloses a image retrieval system and method using image histogram.

- Barber et al., U.S. Patent No. 5,579,471, discloses a image content based image query system and method.

- Golshani et al., U.S. Patent No. 6,594,386, discloses a method for computerized indexing and retrieval of digital images based on spatial color distribution.

- Murakawa, U.S. Patent No. 6,463,432, discloses an apparatus for and method for retrieving images.

- Ito et al., U.S. Patent No. 5,555,318, discloses a thresholding method for segmenting gray scale image, method for determining background concentration distribution, and image displacement detection method and also disclose the concept of area under the histogram.

- Stapleton et al., U.S. Patent No. 5,832,140, discloses automated quality assurance image processing system and further provides the concept of area under histogram.

- Wang, U.S. Patent No. 6,373,979, discloses a system and method for determining a level of similarity among more than one image and a segmented data structure for enabling such determination.

- Shimura et al., U.S. Patent No. 5,644,765, discloses a image retrieving method ad apparatus that calculates characteristic amounts of data correlated with and identifying an image.

- Jain et al., U.S. Patent No. 5,893,095, discloses a similarity engine for content-based retrieval of images.

- Jain et al., U.S. Patent No. 5,915,250, discloses a threshold based comparison system and method for image search and retrieval.

- Tang et al., IEEE Publication, 2000, "A content-based image retrieval system on the mode of network". (pp. 422-425)

- Pearce et al., IEEE Publication, 1994, "Theoretical and experimental comparison of the Lorenz Information Measure, Entropy, and the Mean Absolute Error". (pp. 24-29)

- Pass et al., IEEE Publication, 1996, "Histogram refinement for content-based image retrieval". (pp. 96-102)

- Yuwono et al., IEEE Publication, 1996, "Search and ranking algorithms for locating resources on the world wide web". (pp. 164-171)

- Lee et al., IEEE Publication, 1994, "Query by image content using multiple objects and multiple features: user interface issues". (pp. 76-80)

- Pala et al., IEEE Publication, 2000, "Using multiple examples for content-based image retrieval". (pp. 335 –338).

- Newsome et al., IEEE Publication, 1997, "HperSQL: Web-based query interface for biological databases". (pp. 329-339).

- Chen et al., IEEE Publication, 1999, "A synchronized and retrieval video/HTML lecture system for industry employee training". (pp. 750-755).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Manav Seth whose telephone number is (703) 306-4117. The examiner can normally be reached on Monday to Friday from 8:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, examiner's trainer, Bhavesh Mehta, can be reached on (703) 305-3885. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.
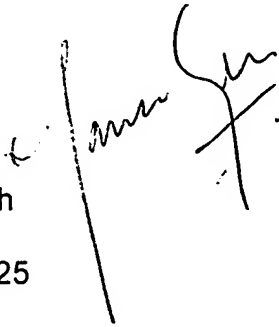
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you

have questions on access to the Private PAIR system, contact the Electronic Business

Center (EBC) at 866-217-9197 (toll-free).

Manav Seth

Art Unit 2625

JOSEPH MANCUSO
PRIMARY EXAMINER